

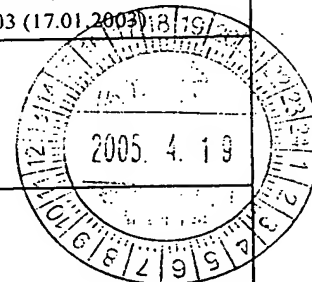
## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>PCT03-034</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/KR2003/001155</b>	International filing date (day/month/year) <b>12 JUNE 2003 (12.06.2003)</b>	Priority date (day/month/year) <b>17 JANUARY 2003 (17.01.2003)</b>
International Patent Classification (IPC) or national classification and IPC <b>IPC7 A61L 9/01</b>		
Applicant <b>LG HOUSEHOLD &amp; HEALTHCARE CO., LTD. et al</b>		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand <b>17 AUGUST 2004 (17.08.2004)</b>	Date of completion of this report <b>16 APRIL 2005 (16.04.2005)</b>
Name and mailing address of the IPEA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer <b>SHIN, Kyeong A</b> Telephone No. 82-42-481-5589



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/001155

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2003/001155

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1 - 4	YES
	Claims	none	NO
Inventive step (IS)	Claims	1 - 4	YES
	Claims	none	NO
Industrial applicability (IA)	Claims	1 - 4	YES
	Claims	none	NO

### 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents from the International Search Report (ISR):

D1: Advanced materials, Vol.14, No.1, 04 Jan. 2002, pp.19-21

D2: KR 1999-68330 A (06 Sep. 1999)

#### 1. Novelty & Inventive Step

Claims 1-4 of the present invention relate to a carbon nanoball for deodorization composed of a spherical hollow core, and a porous carbon shell to which at least one deodorizing material selected from the group consisting of transition metal, oxidized transition metal and alkali metal salt is adhered. The porous carbon shell of the carbon nanoball for deodorization has a multi-layered structure more than 2 layers having different pore sizes, and a pore formed in an outer layer has a larger average diameter than a pore formed in an inner layer.

D1 relates to a method of fabrication of carbon capsules with hollow macroporous core/mesoporous shell structures. Since the carbon capsules have bimodal pore systems of uniform, tunable hollow macroscopic core and mesoporous shell, they could have a wide range of applications, including catalysts, adsorbents, sensors, electrode materials, and advanced storage materials.

D2 relates to a preparation method of metal deposited active carbon having selective adsorption capability for polar contaminants, which has high surface activity and dissociation energy by electroless-plated active carbon with alkali transition metals including copper, nickel and silver.

(Continued on Supplemental Sheet.)

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/001155

## Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

BOX V.

The present invention differs from D1 directed to a carbon capsule comprising a spherical hollow core and a porous carbon shell, and D2 directed to electroless-plated active carbon with alkali transition metals, in that at least one deodorizing material selected from the group consisting of transition metal, oxidized transition metal and alkali metal salt is adhered to the porous carbon shell, and the porous carbon shell has a multi-layered structure more than 2 layers having different pore sizes,

In addition, the present invention cannot be readily invented by a person skilled in the art with the teaching of D1 & D2.

Thus, claims 1-4 of the present invention are novel and inventive.

Accordingly, claims 1-4 meet the requirements of PCT Article 33(2) and (3).

## 2. Industrial Applicability

The present invention directed to a carbon nanoball for deodorization is industrially applicable and consequently meets the requirement of PCT Article 33(4).